



Microsoft®

Windows.net™

Server Family

File Server Technologies

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File Servers Are A Key Scenario

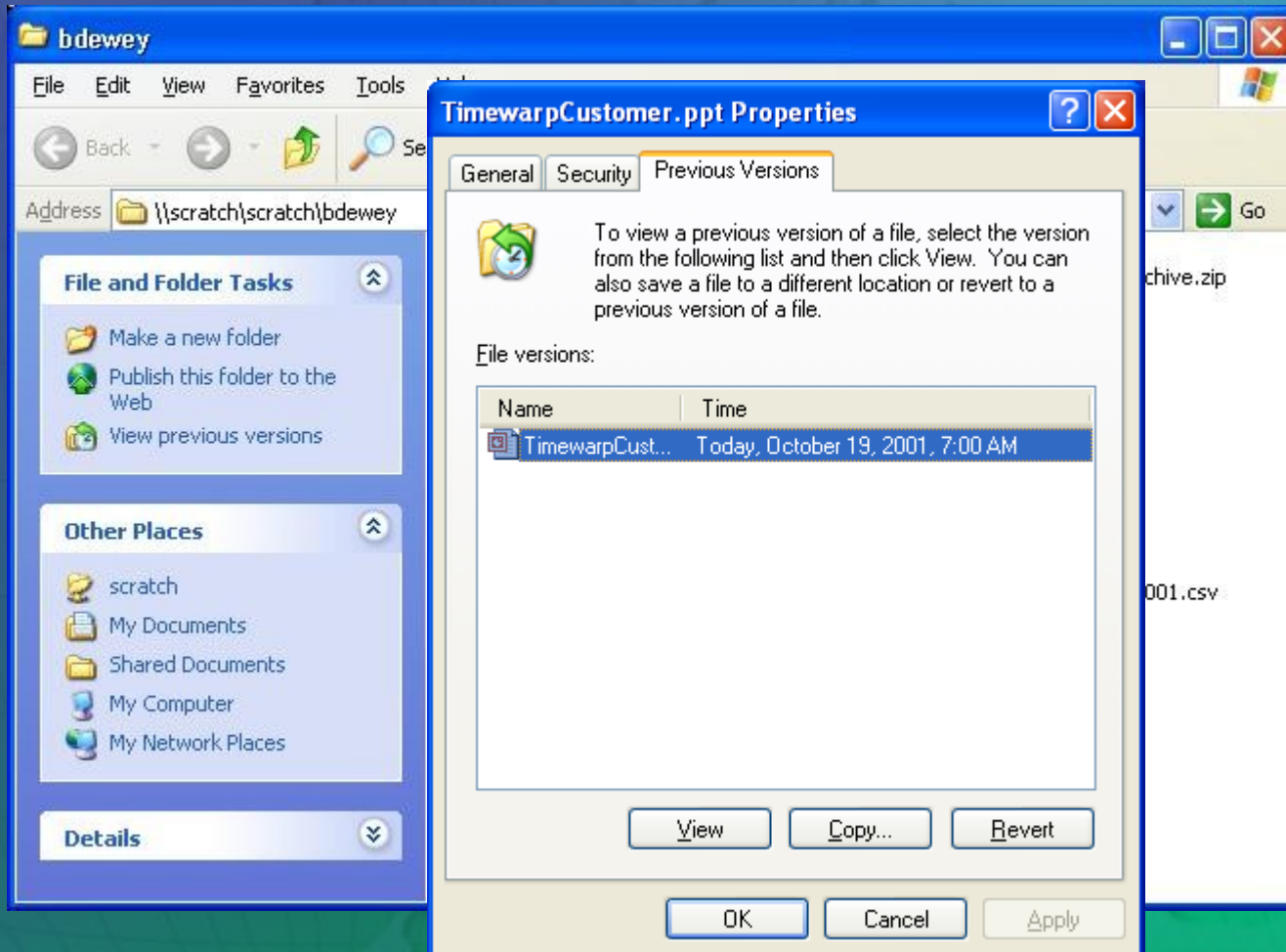
- **File servers are the core of our server business**
- **File servers are the core of our *customers'* business!**
- **Microsoft will continue to innovate**
 - **Reliability**
 - **Performance**
 - **Scalability (up & out)**
 - **Availability & recoverability**
 - **Security and privacy**
 - **Richness of user experience**

Roadmap

- **Client Experience**
 - **Shadow copies**
 - **Client-side caching**
- **Individual File Servers**
- **Federated File Servers**

Shadow Copies

- Make it easy to recover from user



Shadow Copies

demo

Client-Side Caching

- **Goal: Seamless online/offline transition**
- **Goal: Reduce server load**
- **Common scenarios:**
 - **Redirected 'My Documents'**
 - **Running applications from network shares**
- **Windows® XP adds key CSC scenarios:**
 - **EFS encryption of client-side cache**

Roadmap

- **Client Experience**
- **Individual File Servers**
 - **Availability**
 - **Scalability**
 - **Manageability**
- **Federated File Servers**

Availability: Online management

- **Availability - online growth**
 - **Grow Dynamic volumes via MMC (diskmgmt.msc) - as Windows 2000**
 - **Grow Basic volumes via Command-line (diskpart.exe) - new for .NET**
 - **Evidence: **demo** online growth, mirror (same as Windows 2000)**
- **Availability - online backup**
 - **Volume shadow copy service**

Disk Management

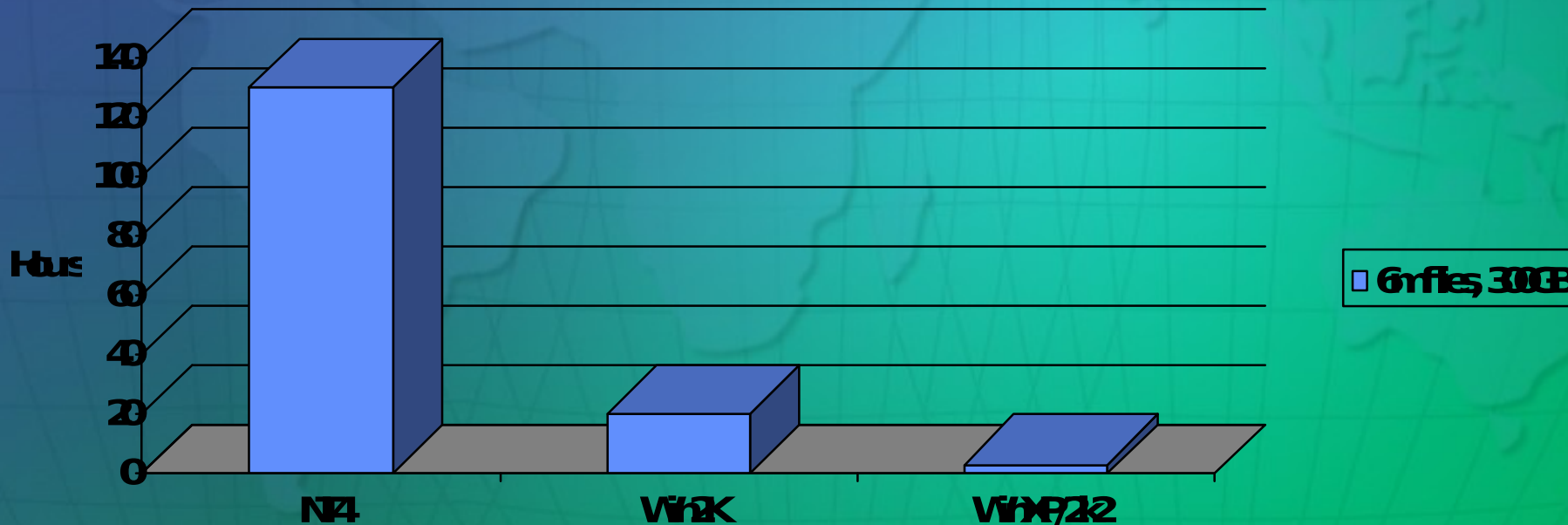
demo

Availability: Driver Quality

- **Plugfests!!**
 - **ISV workshops in Redmond**
 - **Focus on robustness**
- **OCA top 100 ISV bluescreens:
No file system filters!**
 - **(Windows NT® 4.0 study -
12% of bluescreens)**
- **AntiVirus WHQL Logo program**
 - **(Also existed for XP client - McAfee,
Trend, Symantec have qualification)**

Availability: Chkdsk

- NTFS Journaling means < 1% of crashes need chkdsk
- Chkdsk speeds improved over Windows 2000



File Server Manageability

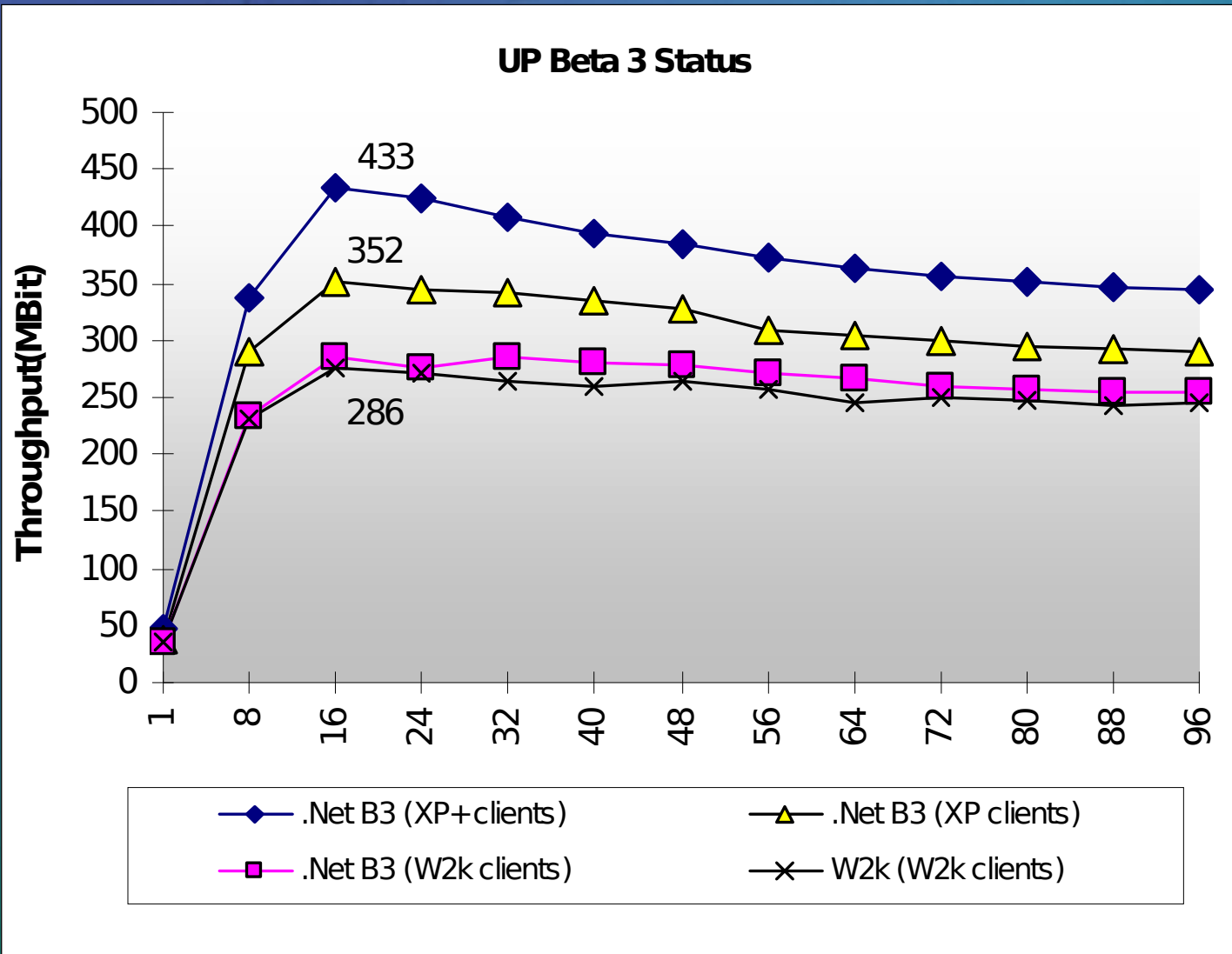
- **Scripting:**
 - **Diskpart for volumes**
 - **FSutil for file system operations**
- **Quotas**
- **Defrag**
 - **Faster**
 - **Includes online MFT defrag for NTFS**

Scaling: Tested NTFS limits

- **Largest tested volume: 17 TB**
Windows 2000
- **Largest tested files: 16 TB uncompressed, 69 TB compressed**
- **20 million files per volume**
- **14 million directories per volume**
- **4 billion allocation units per volume**
- **1.5 million fragments per file**
- **600,000 concurrent open files**

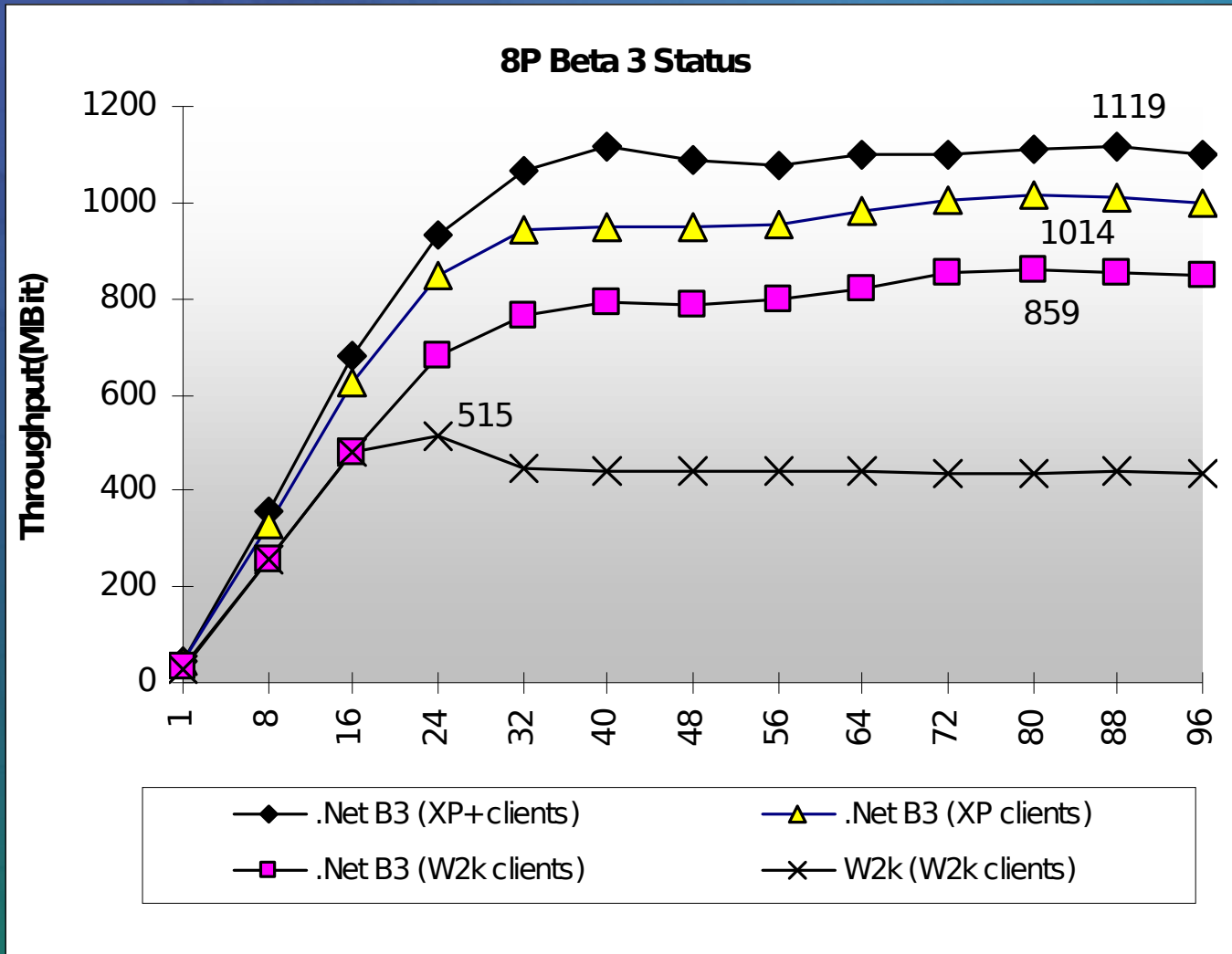
UP Scaling: 50% Gain

Netbench results on Windows .NET Server Beta 3



MP Scaling: 110% Gain

Netbench results on Windows .NET Server Beta 3



Roadmap

- **Client Experience**
- **Individual File Servers**
- **Federated File Servers**
 - **Namespace abstraction**
 - **Load balancing**

As Your Business Grows...

- Unify the namespace of disparate servers
 - \\products\tools, \\products\apps
- Use replicas for load balancing
 - \\products\tools -> \\toolsrv1\public, \\toolsrv2\public
- Use replicas for fault tolerance
- DFS abstraction provides 'service layer'



DFS

demo

DFS In Windows .NET Server

- **New: Multiple roots per server**
 - **Allows flexible configuration of DFS roots into resource groups on clusters**
 - **Allows incremental transition of Windows 2000 target/root servers to .Net**
 - **Allows mix of standalone and domain based DFS roots**
- **New: Delegation of administration**

DFS In Windows .NET Server

- **New: Dynamic site awareness - DFS tracks target servers/root server sites**
- **New: Scalability improvements for configuring DFS**
 - **Reduced time for startup/configuration**
 - **Batch requests for synchronization of DFS roots**
 - **Decreased memory usage**

FRS In .NET Server

- **Making it easier to deploy**
 - Suite of tools provided in Reskit for monitoring/troubleshooting FRS deployments
 - Configuration tools provided in ResKit to deal with large scale deployments
- **Making it more efficient and robust**
 - Staging file space management. Treat it as a LRU cache
 - Reduce the data that is shipped between replicas - compression and suppression
 - Automatic recovery from error conditions

Summary

- **We will continue to improve the client experience**
 - **Tangible server benefits!**
- **Windows remains great choice for individual file servers**
 - **Availability, manageability, scalability**
- **You can run your enterprise on Windows file servers**

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